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METHODOLOGY FOR SELECTING THE CENTER OF GRAVITY AT THE OPERATIONAL LEVEL OF WAR

by

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INTRODUCTION

What is the best method of identifying the Center of Gravity (COG) at the operational level of war? The first question should really be why identify a COG and/or what is a COG's purpose? At the end of the day, a military campaign will cost the nation or coalition blood and treasure, and a correctly identified operational COG will yield the desired end state in the most effective and efficient manner. Identifying the correct COG is crucial to the success of an operation or campaign within the allowable costs. JP 5-0 says, "One of the most important tasks confronting the JFC's staff in the operational design process is the identification of friendly and adversary COGs... This process cannot be taken lightly, since a faulty conclusion resulting from a poor or hasty analysis can have very serious consequences, such as the inability to achieve strategic and operational objectives at an acceptable cost."¹ JP 5-0 is very clear in explaining the reason for selecting a COG and why it is crucial to the success of a campaign. However, it does not provide a clear method for selecting a COG. This may be because many view the selection of the COG as more art than science. Possibly, JP 5-0 does not wish to stifle the creativity of the Joint Force Commander (JFC) and his staff in the selection of the COG. This is understandable, but outlining a potential process or processes does not necessarily stifle creativity. The goal is not to have an absolute prescriptive method for identifying the COG, but to help focus the JFC and his staff to make the process of identifying the COG more effective and efficient without stifling creativity. To make the process a little more scientific, so the art is of better quality. The same way that Operational Design and Operational Art complement one another in the Joint Planning Process.

Before identifying a process, this paper will address the definitions of key terms. The definition of a COG in Joint Publications has evolved over time, but is still not quite as clear and

precise as it could be. One problem is that joint publications do not clearly define the purpose of a COG. This is a grave omission, because it is imperative to understand the purpose of a COG during a campaign before identifying the COG. With a clear definition and purpose of a COG in mind, the JP 5-0 definition of the COG's Critical Capabilities (CCs) also needs a slight revision. This paper will look at the different definitions provided by leading experts and attempt to offer a more focused definition of a COG and clearly identify the purpose of a COG. In addition, this paper will attempt to offer a better definition of CCs. In the end, the need is for Joint Publications to produce a clear definition and purpose for COGs and CCs. This will ensure the JFC and his staff are looking in the right place and for the right things when it comes time for identifying a COG and the subsequent factor analysis of that COG. These small definition additions and changes will make the process of identifying the operational COG more scientific and focused.

With a clear definition and purpose of the COG, the next issue that arises is how many COGs to identify at the operational level of war. The answer is there should be only one at any given time during a campaign. A number of factors can lead to the change of the operational COG, but at any given time during a campaign, there is only one. This stems from the purpose of a COG to provide unity of effort at the operational level of war. There may be instances when a JFC or his staff would like to establish two or more COGs, but they must resist the urge to preserve unity of effort. This paper will look at a way to ensure unity of effort with only one COG at a given time, but staying aware of the ever-changing environment and adjusting the COG when necessary. As a dynamic campaign progresses, the operational COG will most likely shift either from friendly and/or enemy actions or based on the priority of effort during that phase in the campaign. This would lead to changing the operational COG when there is a dramatic

shift in either the friendly or enemy strategy or when the priority objective at the operational level of war changes.

Lastly, the paper will attempt identify the best process to get the planning staff in the ballpark. This paper will first analyze the processes from JP 5-0 and the leading experts as a review. The paper will first review JP 5-0 and Dr. Jack Kem's thoughts on selecting COGs at the operational level of war. Next, the paper will review Dr. Jeff Reilly and COL(R) Dale Eikmeyer's approaches to selecting a COG. After reviewing the current thoughts on the subject, the paper will introduce a blended approach to help frame the problem of selecting an operational COG. In the end, this paper hopes to refine some of the ideas from the various sources and outline a potential process to help identify the operational COG. The hope is this will lead to a more scientific process to narrow the list of potential COGs and then allow the JFC and his staff to apply the art to finalize their selection. Lastly, the paper will apply the recommended COG identification process in a hypothetical campaign setting in Korea.

DEFINITIONS AND PURPOSE

The definition of Center of Gravity has evolved over time from the days of Carl Von Clausewitz until today. Although the definitions have changed over the years they are still to fuzzy. Below are the current definitions for Center of Gravity.

Clausewitz – “The hub of all power and movement, on which everything depends...the point at which all our energies should be directed.”²

JP 5-0 – “A COG is the source of power that provides moral or physical strength, freedom of action, or will to act.”³

Dr. Strange – “Centers of Gravity are agents and/or sources of moral or physical strength, power and resistance.”⁴

Dr. Kem – “[Centers of Gravity are the] physical or moral entities that are the primary components of physical or moral strength,

power and resistance. They do not just contribute to strength; they are the strength. They offer resistance. They strike effective (or heavy) physical or moral blows.”⁵

To get a better definition of a COG, you first need to understand its purpose. The definitions above tend to lead someone to look for a “single point failure.” A single pressure point that if pressure is applied the entire enemy system will collapse in on itself and the enemy will cease to function. Dr. Kem says to look “where a knockout blow can take the enemy out, or at least bring the enemy to a culminating point where he ceases to be effective.”⁶ In today’s world where the enemy is not just an army on the field, but a complex adaptive system of systems, it is extremely unlikely that there is a single point of failure. So what is the purpose of the COG? JP 5-0 says, “The COG is always linked to the objective.”⁷ This is a good start in the correct direction, but Dr. Reilly states the purpose even more clearly. He says, “The principal purpose of a COG is focus.”⁸ Even Clausewitz points in this direction when he says, “the point at which all our energies should be directed.”⁹ In other words, the COG determines the actions taken by a force to achieve their desired objectives and end state. **The purpose of the COG is to provide the focus of effort that will most effectively and efficiently achieve the desired objectives and end state or prevent the enemy from achieving his objectives and end state via his currently planned means.**

Now that the COG’s purpose is outlined, it should be easier to define it. If a COG’s purpose is to focus the effort of a force to achieve the objectives, then the COG is the entity upon which that focus is directed. With that purpose in mind, the following is a recommended definition of Center of Gravity and is partially derived from Dr. Kem’s definition.

The Center of Gravity is the physical or moral entity that possesses the physical or moral strength and the primary means to enable one to achieve their desired objectives and end state.

This definition is focused enough to ensure the JFC and his staff do not waste enormous amounts of time looking for the single point failure that may or may not exist or possibly identify the wrong COG. This definition also clearly links the COG to the desired objectives. The concept of the COG linking actions in time and space to the objectives is visually depicted in Dr. Reilly's cognitive map for Operational Design.

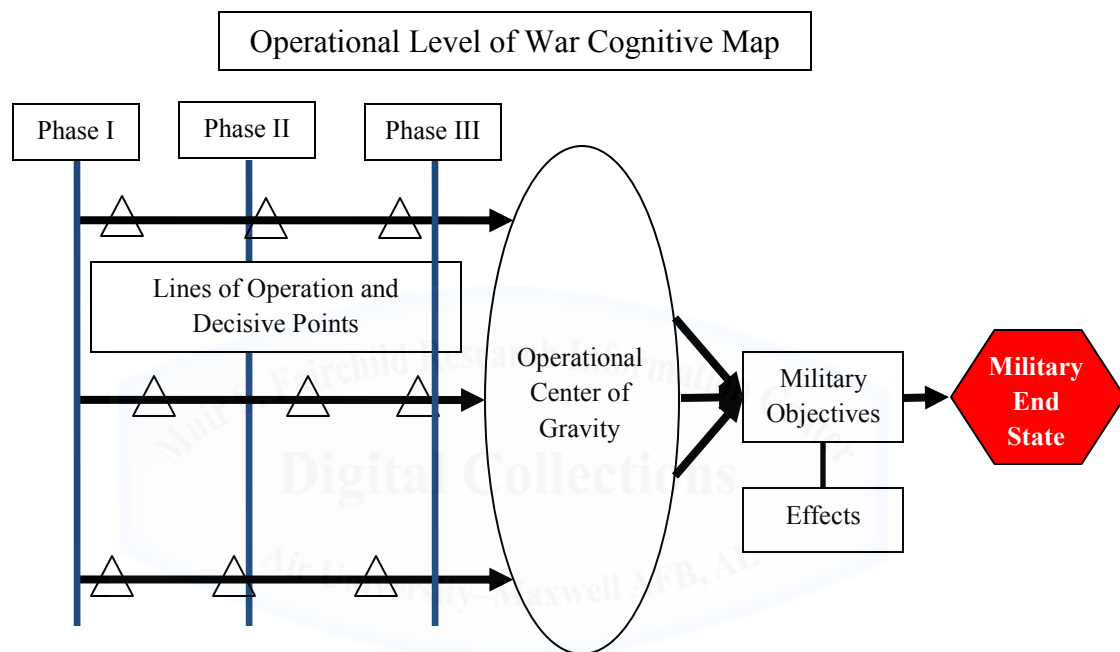


Figure 1.
Operational Design's Cognitive Map¹⁰

The final definition to look at is the definition of critical capabilities. The conflict between JP 5-0 and the other accepted definition by Dr. Strange has been widely written about.

However, it is important to note that based on the recommended definition of the COG above, Dr. Strange's definition best describes a CC. Below are the current definitions.

JP 5-0 – “[A CC is] a means that is considered a crucial enabler for a center of gravity to function as such, and is essential to the accomplishment of the specified or assumed objective(s).”¹¹

Dr. Strange – “[A CC is the] primary abilities which merits a Center of Gravity to be identified as such in the context of a given scenario, situation or mission.”¹²

Another way to say it is, **a CC is what a COG does or has the ability to do to achieve the objectives or deny the adversary his objectives.**

Number of COGs

Now that we have a clear definition of a COG and its purpose, we have to know how many to identify at the operational level of war. However, prior to answering how many COGs exist at the operational level of war, there must be a clear understanding of the three levels of war, strategic, operational and tactical. The levels of war serve to link tactical actions to the desired strategic conditions at the conclusion of a campaign. One difficulty that arises is there are no concrete boundaries that clearly identify a transition from one level of war to the next. A great example is in counter insurgency operations, where a tactical action can have significant strategic impact. For purposes of this paper, the definitions of the levels of war in JP 1-02 are sufficient. JP 1-02 defines the strategic level of war as, “the level of war at which a nation, often as a member of a group of nations, determines national or multinational strategic security objectives and guidance, and develops and uses national resources to achieve these objectives.”¹³ In other words, the strategic level of war is where the senior political and military leaders of the nations involved determine the desired conditions for the world and/or concerned region by applying all of the available instruments of power, such as diplomatic, information, economic

and military actions. JP 1-02 defines the tactical level of war as, “the level of war at which battles and engagements are planned and executed to achieve military objectives assigned to tactical units or task forces.”¹⁴ The definitions of the strategic and tactical levels of war make it easy to distinguish the boundaries between these two levels of war, but at the intermediary level, the operational level of war, the boundaries are much less distinguishable. JP 1-02 defines the operational level of war as, “the level of war at which campaigns and major operations are planned, conducted, and sustained to achieve strategic objectives within theaters or other operational areas.”¹⁵ The operational level of war is arguably the most important level of war because it ensures the tactical actions taken serve to achieve the strategic objectives. It is the crucial link between the tactical level and the strategic level. The operational level of war ensures the military instrument of power is moving in step with the other instruments of power to achieve the strategic end state defined by the senior political leaders.

With a clearer understanding of the levels of war, we can begin to nail down why we limit the number of COGs at the operational level of war. The common perception may be, since there are numerous objectives at the operational level of war and COGs link actions to the objectives then there must be numerous COGs. This perception is correct, but to have multiple COGs at the same time would defeat the purpose of a COG, provide unity of effort. Therefore, there should only be one COG at a time at the operational level of war. At the strategic level of war, there is typically only one COG throughout a campaign. It will typically not change unless the strategic objectives change. At the operational level of war, the COG will likely change and should be planned for and expected. One example is if you neutralize your enemy’s operational COG, thereby removing his primary means to achieve his objectives, this will prevent him from achieving his objectives in the manner he planned to. This does not necessarily mean he will

give up. If he still has the will to try to achieve his objectives then he will implement a secondary means of achieving them. This new means will become the operational COG. Another example goes along with the standard joint phasing of a campaign. The primary focus from one phase to the next may be drastically different, such combat operations transitioning to stability operations. In this instance the operational COG, the focus of the campaign, would most likely require changing to ensure the proper unity of effort for the operation. Again, Dr. Reilly provides an excellent visual reference.

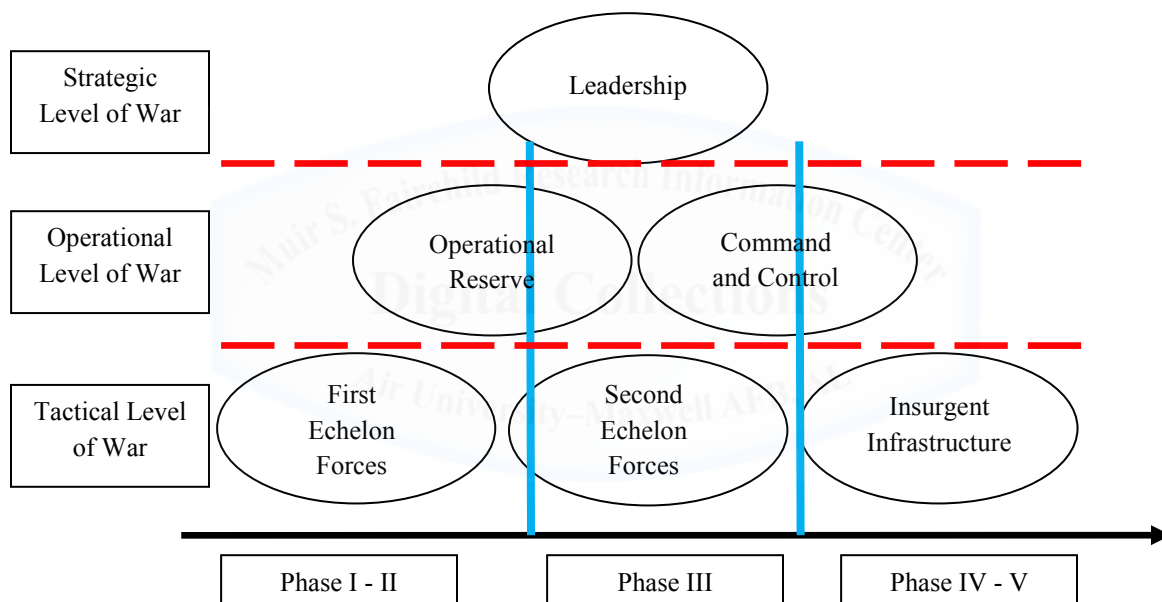


Figure 2.
Transformation of COGs during a campaign.¹⁶

This is not to imply that the change of an operational level COG should be planned solely based on the phasing of an operation. The point is, that an operational COG is a dynamic entity that can change at any moment during a campaign based on a number of factors. An example of the operational COG changing took place in OIF. During the initial stages of OIF, the operational level COG was identified as the Iraqi Republican Guard. As major combat operations concluded, the operational COG shifted to the insurgent forces that were beginning to appear. JFCs and planners must attempt to anticipate these changes or at the very least react to the current situation to ensure the proper focus of the operation. If the JFC and his planners identify one operational COG and are subsequently able to adapt based on the current situation, they can provide the needed focus of effort and prosecute the most effective and efficient campaign.

IDENTIFICATION PROCESS

While there has been a great deal of discussion on COGs over the years, there has been very little written about the best way to identify the COG at the operational level of war. It is usually explained as a planning group sitting around the table arguing and eventually they just decide on one. While this method may work, there should be a system to assist the planning group in framing the situation to expedite the process. Ultimately, there will be a number of valid suggestions for the COG and the JFC will need to decide where he wants the focus of the campaign at specific times. So how does the staff correctly identify the operational COG?

JP 5-0 states that, “the COG is always linked to the objective” and “could also change if the objective changes.”¹⁷ The COGs are identified in step 2 of the Joint Operational Planning Process (JOPP), mission analysis. JP 5-0 says that the operational level COG is typically associated with the enemy’s military forces, but is not limited to the military. The COG will also be very difficult to destroy because it will be among the enemy’s strengths and will be protected.

JP 5-0 looks at the enemy as a system of systems and states that the COG will most likely not be a single node in the system. The COG will normally be a set of nodes and their corresponding relationships with one another, as depicted in Figure 3. The goal of the process, according to JP 5-0, is to identify the means by which the enemy has freedom of action and the will to fight. Once these means are identified, the planners must confirm they are essential to the enemy's strategy to achieve his goals. This will yield the correct COG. To execute the process, the planners must first have a clear understanding of the enemy as a system. They must understand the enemy's strengths, weaknesses and everything about how the enemy wages war, such as how they organize, train, and execute command and control of their forces. This analysis will lead to the critical system or set of nodes across separate systems that are critical to the enemy achieving his objectives or preventing the friendly forces from achieving their objectives.

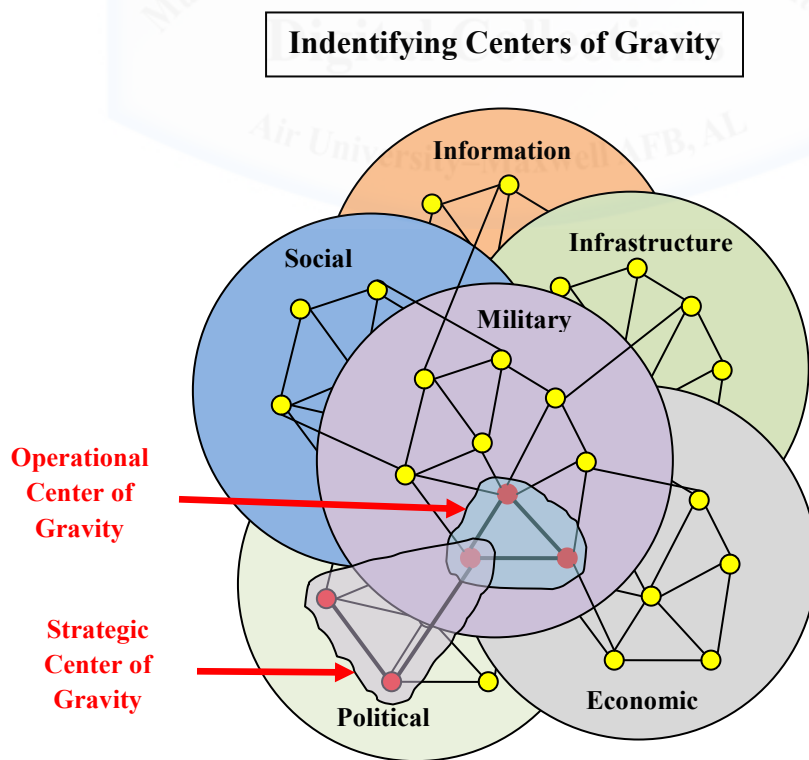


Figure 3.
JP 5-0 Identifying Centers of Gravity¹⁸

Dr. Jack Kem says to find the COG you must look for the source of “real power.”¹⁹ “From the planning perspective, determining the COG should be to discern where the real power is and where a knockout blow can take the enemy out.”²⁰ Dr. Kem goes on to say that at the operational level of war the COG is usually a fielded military force and is theater/situation dependent. The operational COG must be a physical entity that can be attacked and destroyed via direct or indirect means. Dr. Kem also believes that in most situations there should be only one COG at the operational level but says during complex scenarios, such as major combat operations and irregular war occurring at the same time, there may be more than one. As far as the method of selection, Dr. Kem believes in the open debate method in which planners openly discuss all options. He states, “the discussion and open debate that lead to the identification of the COGs help focus the staff and commanders on the all-important task of identifying and understanding the problem.”²¹ Dr. Kem believes that this method brings out the creative reasoning and thinking that is required to identify the true source of and power.²²

Dr. Jeff Reilly states, “that at minimum, JFCs and their staffs should consider enemy and friendly actors, their interests and intent, key systems supporting those actors in the operational environment, their strengths, weaknesses, and potential courses of action” when identifying friendly and enemy COGs.²³ Dr. Reilly provides the table below to assist in the organization of the information and ensure focus on only the crucial actors.²⁴

Actor	Objective	Systems Analysis	Strengths	Weaknesses	Courses of Action
		Political			
		Military			
		Economic			
		Social			
		Infrastructure			
		Information			

Figure 4.
Dr. Reilly's Table for Identifying Centers of Gravity²⁵

Dr. Reilly also states that it is imperative to link the enemy and friendly COGs back to the friendly objectives and end state. He also suggests that it would be beneficial to add the end state and objectives to the table to ensure proper focus of the COG selection.²⁶ The most important point that Dr. Reilly emphasizes is that the process is iterative. As the planners progress through the planning process and the plan flexes, it is incumbent to always come back and ensure that the previously identified COG is critical to the end state and objectives.

The common thread between all of the above examples is they say to look at the desired end state and objectives and then identify the actor, or means, the enemy will use to accomplish their objectives or prevent the friendly forces from achieving their objectives. COL(R) Dale Eikmeyer recommends a slightly different approach. COL Eikmeyer says to use the framework of ends, ways and means to first identify the critical capability the enemy will use to accomplish their objectives and that will identify the COG.²⁷ COL Eikmeyer uses this framework to answer these three questions: "What is the end state or goal that we or our adversaries want to achieve? What action (the ways) will achieve the end state? Lastly, what are the resources or means required to execute the action or way?"²⁸ To identify the enemy COG, the first thing the planners need to do is ensure they have a clear understanding of the enemy's desired end state.

Next, they should begin to list the ways, the actions, the enemy will take to accomplish their end state, attempting to identify the primary way. Then list the means, actors, required to execute the ways to accomplish the end state. Finally, select the actor that “possesses the inherent critical capability to execute the chosen way.”²⁹ COL Eikmeyer stresses the second step is the most important, identifying the action or critical capability. This leads to correctly identifying the COG. Figure 5 below is a diagram COL Eikmeyer provides of his approach. COL Eikmeyer also provides a test to ensure the selection of the correct COG. The test is called the *Supported and Supporting test*.³⁰ The purpose of the test is to separate the COG from the other means by determining the primary actor and those that support the primary actor. To do this, planners need to ask three questions. “What is my goal? How can I achieve it (critical capability)? What do I need or have that can do it? The answer to the last question is the center of gravity.”³¹

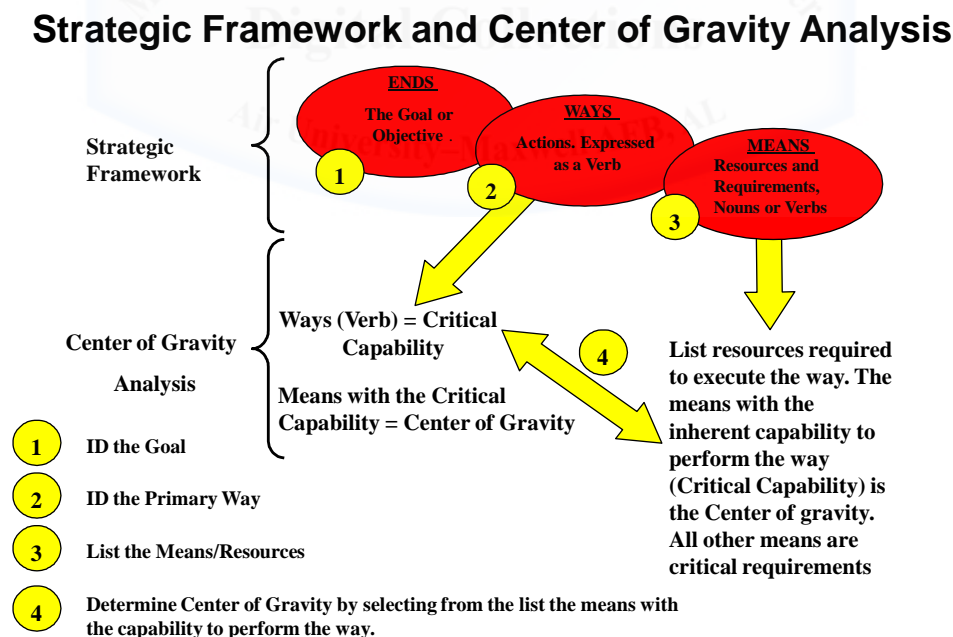


Figure 5.
COL(R) Dale Eikmeyer’s approach to identifying COGs

After reviewing the above approaches, there can be a more scientific method for selecting the operational COGs. The one thing that the above approaches do not mention is when to identify COGs. JP 5-0 says that the COGs are identified in step 2 of the Joint Operational Planning Process (JOPP), mission analysis. However, as Dr. Reilly points out the entire JOPP is iterative, and this really is the key. To identify the correct COGs, the planners would need to know a great deal more information than they do at the beginning of mission analysis. Information that the planners may not know until after the campaign is underway, such as the enemy course of action. Therefore, it is imperative to continuously revisit the COGs to ensure that as new information becomes available, the previously identified COG is still correct. Assuming the required information is available, below is a process to identify the adversary operational COG but the process also works to identify the friendly COG.

1. At the start of the JOPP when the required information may not be completely known and to help understand the enemy and how he wages war, it is suggested to start with Dr. Reilly's table.

Actor	Objective	Systems Analysis	Strengths	Weaknesses	Courses of Action
		Political			
		Military			
		Economic			
		Social			
		Infrastructure			
		Information			

2. List the adversary's desired objective/end state.
3. List the friendly operational objectives.
4. As the objectives are listed, determine if there are clear distinctions in the focus of the campaign at specific times that may lead to different COGs. Such as a campaign shifting from combat operations to stability operations, in this case the operational COG will most

likely change, depending on the scenario. If this is the case, then execute a separate process for each primary objective for that given time during the campaign, i.e. potentially different operational COGs.

5. Identify the most likely adversary strategy or course of action to achieve their objective or prevent the friendly forces from achieving their objective.
6. From Dr. Reilly's table, select the primary actors that will be used to execute the adversary strategy or course of action.
7. Last, use COL Eikmeyer's supporting/supported test to determine the supported actor in the adversary's course of action and this is the enemy operational COG for that specific timeframe during the campaign.

The above process is not intended to be a checklist procedure. It is only a manner to organize the required information to identify the operational COGs, and allow ease in revisiting the COG selection process throughout campaign planning and execution. Below is an example of how the process could work.

KOREAN SCENARIO EXAMPLE

The following example is based upon a fictional scenario set on the Korean peninsula. Since all of the required information about friendly and enemy objectives and courses of actions is available, step 1, Dr. Reilly's table, will be skipped.

Step 2. List adversary primary objective. Reunite the Korean Peninsula under the DPRK.

Step 3. List friendly operational objectives. Deter DPRK offensive military operations. If deterrence fails, defend ROK national integrity and restore borders and demilitarized zone.

Step 4. Determine if objectives or phases may drive multiple operational COGs. Not applicable in this scenario.

Step 5. Determine adversary strategy or course of action. The DPRK strategy is to quickly advance down the peninsula with light infantry to occupy as much of the peninsula as possible and then sue for peace.

Step 6. List primary actors of adversary strategy or course of action. First echelon forces will rapidly move down the peninsula to occupy ground. Front line artillery will soften friendly front lines to facilitate a breakthrough for first echelon forces. DPRK special forces will operate in the friendly rear area to harass friendly troops.

Step 7. Supporting/Supported Test. With the actors above, the artillery and SOF are supporting forces for the first echelon forces to occupy ground in the ROK. Therefore, the first echelon forces would be the enemy operational COG. They are the essential means for the DPRK to achieve their objective.

CONCLUSION AND RECOMMENDATIONS

So what is the best method of identifying the Center of Gravity (COG) at the operational level of war? After a review of the sources, we see they all are very clear in explaining the reason for correctly identifying the COG and how it is critical to the success of a campaign. However, none of the literature provides a clear comprehensive method for selecting a COG. This paper attempted to inspire a comprehensive process by combining information from the leading experts and Joint Publications. This was done not to create a checklist, but to make the process a little more scientific. Thereby, providing a method to focus a planning group and reduce the amount of time to discover and identify the operational COG.

While in the search of the COG identification process, this paper addressed the definitions of key terms. The definition of a COG in Joint Publications has evolved over time,

but is still not quite as clear and precise as it could be. The first recommendation is to refine the definition of a COG in all Joint Publications to align more with the leading experts' definition.

The Center of Gravity is the physical or moral entity that possesses the physical or moral strength and the primary means to enable one to achieve their desired objectives and end state.

Another problem discovered in JP 5-0 is the lack of verbiage that clearly defines the purpose of a COG. This information is required to fully understand the definition of a COG and crucial to correctly identifying the COG. The second recommendation of the paper is to include clearer verbiage in Joint Publications about the purpose of the COG.

The COG provides the focus of effort that will most effectively and efficiently achieve the desired objectives and end state or prevent the enemy from achieving his objectives and end state via his currently planned means.

The third recommendation is to revise the definition of Critical Capabilities in all Joint Publications.

A CC is what a COG does or has the ability to do to achieve the objectives or deny the adversary his objectives.

The revision of these definitions in Joint Publications will help ensure the JFC and his staff are looking in the right place and for the right things when it comes time to identify the COG and the subsequent factor analysis of that COG. These focused definitions alone will help make the process a little more scientific and focused.

After refining some definitions and outlining the different levels of war, the paper analyzed the reason for identifying only one operational COG at a time. The reason for this stems from the purpose of a COG, to provide unity of effort at the operational level of war.

There will be instances when the JFC or his staff would like to establish two or more COGs, but they must resist the urge to preserve unity of effort. There will be instances when the COG will

change, such as the end state changes or a change in the friendly or enemy strategy. During the planning and execution of the campaign, the JFC and his staff need to stay aware of this ever-changing environment and adjust the COG when necessary.

The paper then reviewed a few processes from Joint Publications and the leading experts. After looking at JP 5-0, Dr. Jack Kem, Dr. Jeff Reilly and Col(R) Dale Eikmeyer's approaches to selecting a COG, the paper introduced a new blended approach for organizing the information to identify the operational COG. The last recommendation is to include an example of a process to identify the COG, like the blended approach in this paper, in JP 5-0. In the end, this paper hoped to refine some of the ideas from the various sources and outline a potential process to help identify the correct operational COG. The author hopes that this paper will further the operational COG conversation and lead to a more "scientific" process to narrow the list of potential COGs; thus enabling the JFC and his staff to apply the "art" to identify the correct operational COG for their given situation.

¹ Joint Publication (JP) 5-0. *Joint Operation Planning*, page IV-8

² Carl von Clausewitz, *On War*, pg. 595-596

³ Joint Publication (JP) 1-02. *Department of Defense Dictionary of Military and Associated Terms*, pg. 79

⁴ Strange, Dr. Joe. *Centers of Gravity and Critical Vulnerabilities: Building on the Clausewitzian Foundation So That We Can All Speak the Same Language*. 2nd ed. pg. 43

⁵ Kem, Dr. Jack D. *Campaign Planning: Tools of the Trade*. 3rd ed. pg. 25

⁶ Kem, Dr. Jack D. *Campaign Planning: Tools of the Trade*. 3rd ed. pg. 26

⁷ Joint Publication (JP) 5-0. *Joint Operation Planning*, page IV-8

⁸ Reilly, Dr. Jeffrey M. *Operational Design: Shaping Decision Analysis through Cognitive Vision*. pg. 22

⁹ Carl von Clausewitz, *On War*, pg. 595-596

¹⁰ Reilly, Dr. Jeffrey M. *Operational Design: Shaping Decision Analysis through Cognitive Vision*. pg. 14

¹¹ Joint Publication (JP) 1-02. *Department of Defense Dictionary of Military and Associated Terms*, pg. 134

¹² Strange, Dr. Joe. *Centers of Gravity and Critical Vulnerabilities: Building on the Clausewitzian Foundation So That We Can All Speak the Same Language*. 2nd ed. pg. 43

¹³ Joint Publication (JP) 1-02. *Department of Defense Dictionary of Military and Associated Terms*, pg. 519

¹⁴ Joint Publication (JP) 1-02. *Department of Defense Dictionary of Military and Associated Terms*, pg. 534

¹⁵ Joint Publication (JP) 1-02. *Department of Defense Dictionary of Military and Associated Terms*, pg. 395

¹⁶ Reilly, Dr. Jeffrey M. *Operational Design: Shaping Decision Analysis through Cognitive Vision*. pg. 33

¹⁷ Joint Publication (JP) 5-0. *Joint Operation Planning*, page IV-8 – IV-9

¹⁸ Joint Publication (JP) 5-0. *Joint Operation Planning*, page IV-11

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- ²⁸ COL (R) Dale Eikmeyer, "Changing the way we think about Centers of Gravity"
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